

2c Land-atmosphere – Cross-ECVs



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2a Land-atmosphere – Cross-ECVs



- 27 projects
- 6 cryosphere
- 5 ocean
- 5 atmosphere
- 7 land
- 2 cross-ECV
- CMUG, toolbox



Implemented by ECMWF as part of The Copernicus Programme

Climate Change Service

- ECV Products
 - Atmospheric Physics
 - Atmospheric composition
 - Ocean
 - Land hydrology & cryosphere
 - Land biosphere
- Quality Controlled Observations
- Data Rescue

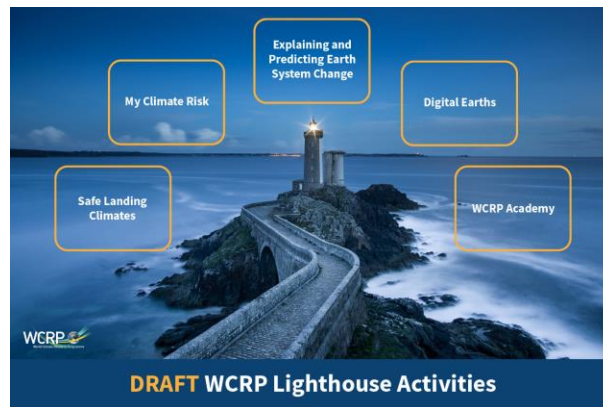
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WCRP

GRAND CHALLENGES



1. Foster and deliver the scientific advances and future technologies required to:
 - Advance understanding of the multi-scale dynamics of Earth's climate system
 - Quantify climate risks and opportunities



2. Develop new institutional and scientific approaches required to:
 - Co-produce cross-disciplinary regional to local climate information for decision support and adaptation
 - Inform and evaluate mitigation strategy

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1. How to further combine individual ECVs in a more system-focussed approach?
2. Which cross-ECVs do we want to support but need further input, both in terms of existing ECVs' contribution and new ECVs
3. How could (should?) we in future put ECVs into clusters?
4. How could projects facilitate benefits for society e.g. provisions around scaling/regional challenges faced by potential operational users?



1. How to further combine individual ECVs in a more system-focussed approach?

- Which key synergies are currently not integrated ?

Energy budget?

Cycles are current uncoupled

Lateral fluxes and interactions (e.g mangrove forest (land) and oceans

Regional water cycling -> for major constrained river basin

Land-atmosphere coupling diagnostics

LULC and phenology

- What are the strengths and weaknesses of combining ?

There are many ways to combine ECVs (processes, spheres, cycles, etc.)

- Are you in favour of combining ?

Proposal: Hybrid structure: groups of ECVs per domain + more x-ECV activities

2. Which cross-ECVs do we want to support but need further input, both in terms of existing ECVs' contribution and new ECVs

- How effective are cross-ECV projects (strengths / weaknesses) ?

WN: inconsistencies in data (resolution, periods, use of ancillary data etc.)

Spatial and temporal resolution is an issue

CCI suite is incomplete, CDRs from elsewhere are needed; Not only "CCI" ECVs

Data assimilation to constrain model with multiple ECVs (CMUG)=> assess consistency

- What are the key projects within and beyond CCI land-atmosphere ?

- Are there (external) projects that could contribute to CCI+ strategic objectives ?

1. How could we in future put ECVs into clusters? Why do we want to cluster?

Cluster type	Examples	Strengths	Weaknesses	Vote
Cycles	Regional WC	closure/consistency		Yes! (MH)
Spheres				
Geographical				
Technical				
Topical / Natural hazard				
Challenge-led / science question	A cluster of key ECVs suitable for ESM/LSM evaluation			
Lead to new ECVs?	ET, RZSM, ...			

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4. How could projects facilitate benefits for society e.g. provisions around scaling/regionality challenges faced

by potential operational users?

- What are the societal benefits of land/atm-ECV's ?

Addressing climate change

- identification of land-degradation hotspots
- verification of e.g. deforestation reported by countries vs EO-based

Early warning indicators / monitors

To the first one, land-atm ECVs have a direct impact on human health and livelihood in a way that ocean and cryosphere don't: air quality, crop health, drought

- evaluation of ecosystem resilience to extremes

drought monitoring

Water resource monitoring (irrigation, etc.)

Use of ECVs to calibrate seasonal forecasts of "impact" variables, e.g. linking flooding/disease or vegetation/agricultural production to forecasts of precipitation.

Pest risk monitoring...locust swarming, crop damage etc

Links with burnt areas and other ECVs? We can expect LST and ET would show consistent changes/signals following fire disturbances

Disentangling human and natural factors explaining crop losses (and other conditions as fires, land degradation and water shortage)



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4. How could projects facilitate benefits for society e.g. provisions around scaling/regionality challenges faced

by potential operational users?

- Has the societal benefit been realised by CCI?

CO2 natural and anthropogenic fluxes and methane emission monitoring. Big progress in Europe thanks to CCI. CO2M, CHE follow on in future.

For some ECV like land cover, international institutions took over the results to develop their own indicators like green growth indicator by OECD, environmental accounting by FAO-Stat to get the countries moving on their own statistics. These are applications beyond the climate challenges which translate in many users

- What are the societal-benefit challenges for CCI+ ?

Links between ECVs and SDGs (Goal 15.3 on land degradation neutrality (UNCCD))



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Any other business ?

